But the chief aim of the science-art classes will be to encourage a pursuit of scientific truth for its own sake, not for the sake of displaying talent in making beautiful drawings to be praised for them, nor for the money to be got for them when drawn, but, *simply and only, for the sake of the* TRUTH, which will yield us pure and incessant pleasure all our lives, and engender a sincere reverence for the Creator who has clothed his truths in wrappages of beautiful blossoms, and pure crystals, and opalescent clouds; in wrappages, too, which appear mean and even ugly, but they are wrappages only; even sin—that, too, is a wrappage, and looks very ugly, and is very revolting, but it covers some good, some truth which lies hid in every human heart, if we will only seek to find it.

There is a vast amount of real art-power unutilised, and so wasted, in our public schools, through narrowness of purpose in the teaching. It has been so amongst ourselves, though what we have done we have done thoroughly. We have laid a sound foundation in close observation of beautiful form and acquisition of technical power in representing it. In adding to it these nature-drawing classes, we have nothing to unteach. The field of work is simply widened that the power may be the more effectually utilised with more pleasure and with greater profit to the student, not only while at school, but as a pursuit in after life, and possibly drawing many from pleasures which are ugly, coarse, bad, and fleeting. This is a view of nature-drawing which parents might think about not without profit to their children. The pursuit of scientific truth, whether in the shape of landscape-art or of science-art, is a very noble pursuit, a very lasting pleasure; besides which science and art cannot fail to be mutually benefited, mutually advanced, in the long run, by such a conjunction as this, for indeed art loses her right hand when divorced from science, and science loses her right hand when divorced from art.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The following have been elected to the General Board of Studies:—Mr. H. M. Taylor, by the Special Board for Mathematics; Prof. Liveing, by the Special Board for Physics and Chemistry; Dr. Vines, by the Special Board for Biology and Geology.

The election to the Cavendish Professorship of Experimental Physics will take place on December 22. The endowment of the professorship is 850*l*. a year.

The provision of 100 additional microscopes for the Biology Schools has been sanctioned, and a small charge will be made to students for their use.

Mr. C. T. Heycock, of King's College, has been approved as a Teacher of Chemistry, under the regulations for medical study.

The Syndicate for obtaining plans for a Geological Museum and Chemical Laboratory has been re-appointed.

Clare College offers to give scholarships of from 40*l*. to 60*l*. for Natural Science by examination, beginning March 19 next. The subjects will be Chemistry and Chemical Physics, Botany and Geology. A fortnight's notice will be required. Candidates, who must be under nineteen on the day of examination, must also pass in Elementary Latin, Greek, and Mathematics.

It is announced that in the next Fellowship election at St. John's College (November 2, 1885) regard will be paid to candidates' original dissertations or other writings, the candidates to be prepared to be examined in the subject-matter of the same. Candidates may also be examined in special subjects chosen by themselves, provided they give full and precise information regarding such subjects not later than June 1. The performance of the candidates in the University and other examinations will be regarded.

SCIENTIFIC SERIALS

Journal de Physique, October 1884.—The constitution and origin of group B in the solar spectrum, by M. L. Thollon (one plate).—On the colour of water, by M. J. L. Soret.—The effect of the electrical state of the surface of a liquid on the maximum vapour-tension of the liquid in contact with the surface, by M. R. Blondlot (one figure).—On the measurement of the maxima and minima electromotive forces in cells with a single electrolyte, by M. Emile Reynier (two figures).—Standard cell for the measurement of electromotive forces, by M. Emile Reynier.—On the chemical theory of accumulators, by M. Emile Reynier.—On the electrolysis of solid glass, by E. Warburg.

Journal of the Russian Physico-Chemical Society (Physical Section), vol. xv., 1883.—On an air-calorimeter, by N. Hesehus.—On a differential air-calorimeter, by W. Preobragenski.—On the critical temperature of isomerides and bodies belonging to the same homologous series, by A. Nadejdine.—New application of Carnot's theorem, by B. Sresnewsky.—On an algebraic transformation and its applications to mathematical physics, by by N. Slouguinoff.—On the focal properties of diffracted rays, by M. Mertching.—On the peculiar properties of caoutchouc, by N. Hesehus.—Method of determining the mean tint of a multi-coloured surface, by Th. Petronchewsky.—On the cause and the law of the change of electrical resistance of selenium by the action of light, by N. Hesehus.—On the relation between the magnetic moment of a bundle of iron wire, its mass, and the diameter of the constituent wires, by P. Bakmetieff.—Note on organ-pipes, by P. Bakmetieff.—On some phenomena of permanent magnetism, by P. Bakmetieff.—On the luminous phenomena accompanying electrolysis, by N. Slouguinoff.—On the theory of gratings traced on curved surfaces.

Royal Academy of Belgium, Nos. 9 and 10, 1884.—Among other communications is a paper by Dr. J. MacLeod describing some interesting particulars respecting the structure and homologies of the anterior intestine of the *Arachnides*. In the *Phalangides* he has found a gland of the same nature and function as the coxal glands recently described by Prof. E. Ray Lankester as belonging to the *Limules*, the *Scorpionides*, and the *Araneides tetrapneumones*. In the *culs-de-sac*, moreover, of the male gland of the *Trombidium holosericeum*, he has found, in all the individuals examined by him, ovules situated between the mother-cellules of the spermatozoides, though there was no question there of a functional hermaphroditism.—A paper by Emile de Borchgrave gives a graphic sketch of the history of Etienne Douchan, Emperor of Servia, and the Balkan Peninsula in the fourteenth century, and of the events which led up to the battle of Kossovo, the grave of the liberty and greatness of Servia.

Cincinnati Society of Natural History.—In the October *Journal* are two papers by U. P. James: one describing four new species of fossils from the Cincinnati group, the other treating of Conodonts and fossil annelid jaws.

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, December 11.—J. W. L. Glaisher, F.R.S., President, in the chair.—The Rev. T. C. Simmons, Christ's College, Brecon, and Mr. W. J. Ibbetson, Clare College, were elected members.—Mr. Tucker read a paper on a group of circles connected with the nine-point circle considered as the locus of the intersections of orthogonal Simson lines. If PL, PM, PN are the perpendiculars from any point of the circum-circle on the sides BC, CA, AB of ABC, then LMN is a Simson line: if POP' be a diameter, then the Simson line $L'M'N'$, corresponding to P', intersects LMN at right angles in a point Q, on the nine-point circle, which is also the inscribed circle of the tricusp, enveloped by the Simson lines. These properties were stated in a paper by Steiner ("Crelle," Band liii.). In the present paper points l, m, n are taken on PL, PM, PN, such that $Ll = K.PL$, $Mm = K.PM$, $Nn = K.PN$. It was shown that the lines lmn, $l'm'n'$ intersect at right angles on a system of circles whose centres lie on the line connecting the circum-centre and ortho-centre (H) of ABC, that the sets of Q points (as above) lie on another straight line through H: that the circles are inscribed in tricusps, the points of contact lying on three straight lines symmetrically situated and passing through H. In the special case of nul-radius, *i.e.* when the (K) circle becomes the ortho-centre, it was seen that the images of any point on the circum-circle with regard to the three sides lie on a straight line through H.—Mr. Tucker then read parts of a paper by Mr. R. A. Roberts, entitled "Notes on the Plane Unicursal Quartic."—Two posthumous notes by the late Dr. Spottiswoode, P.R.S., were communicated, viz. on quadratic transformations, and to find whether a (certain) quadratic transformation be possible.—The Treasurer (A. B

Kempe, F.R.S.) made a short communication as to the mode of proof of the well-known theorem that, if $A\,D\,B\,E\,C\,F\,A$ be a hexagon in a plane, and if $A\,B\,C$ be collinear and $D\,E\,F$ be also collinear, then the intersections of the opposite sides of the hexagon are also collinear.—Mr. G. Heppel stated the following property of the equation to a central conic, $ax^2 + 2hxy + by^2 + c = 0$, which he had not met with in the ordinary textbooks. The co-ordinates being rectangular, then, in the case of the ellipse, if $\frac{h}{c}$ be $+^{ve}$, the major axis passes through the first quadrant; in the case of the hyperbola, if $\frac{h}{c}$ be $-^{ve}$, the transverse axis passes through that quadrant. This property is proved by supposing the equation transformed to $\frac{x^2}{p^2} \pm \frac{q^2}{q^2} = 1$, and then transforming back again, so as to make the equation identical with the original equation. The comparison of coefficients gives the above law.—The President communicated a result he has obtained in elliptic functions, which will appear in a forthcoming paper.

Zoological Society, December 2.—Dr. St. George Mivart, F.R.S., Vice-President, in the chair.—Col. Biddulph exhibited a stuffed specimen of the Wild Sheep of Cyprus (*Ovis ophion*), sent for presentation to the British Museum by Sir Robert Biddulph, the High Commissioner of Cyprus.—Col. Biddulph also exhibited three heads of the Wild Sheep of Beluchistan, named *Ovis blanfordi* by Mr. Hume, and drew attention to their similarity to *Ovis cycloceros* from the Salt Range, which led him to express doubts as to the distinctness of *Ovis blanfordi* as a species.—The Secretary called the attention of the meeting to the death, on July 5 last, of the Greater Vasa Parrot (*Coracopsis vasa*), presented to the Society by the late C. Telfair, Esq., in July 1830, which had thus passed fifty-four years in the Society's Gardens, and made some observations on a peculiar habit of this species.—A communication was read from the Rev. A. M. Norman and the Rev. T. R. R. Stebbing, containing an account of the first portion of the Crustacea Isopoda dredged during the expeditions of the *Porcupine*, *Lightning*, and *Valorous*. The memoir contained descriptions of the representatives of the three families Tanaidæ, Apseudidæ, and Anthuridæ obtained during the several expeditions. A great number of new forms, chiefly from deep water, including several genera (*Sphyraphus*, *Alsotanais*, and *Tanaella* among the Tanaidæ, and *Anthelura*, *Hyssura*, *Cyathura*, and *Calathura* among the Anthuridæ), were described.—Mr. G. E. Dobson, F.R.S., exhibited a diagram designed to illustrate the evolution of the Mammalia, after Huxley.—Prof. F. Jeffrey Bell read the fifth of his series of studies in Holothuroidea. The present paper gave some further information on the characters of the Cotton-Spinner (*Holothuria nigra*).—Mr. J. Bland Sutton read a paper on the parasphenoid, the vomer, and the palato-pterygoid arcade of the vertebrated skeleton. Mr. Sutton came to the conclusion that the parasphenoid of fishes was the homologue of the vomer of mammals.—Mr. G. A. Boulenger, F.Z.S., read some notes on the edible frogs introduced into England, which he referred to two forms—*Rana esculenta typica* of France and Belgium, and *Rana esculenta lessonæ* of Italy.—A communication was read from the Count T. Salvadori containing remarks on certain species of birds from Timor Laut.—A communication was read from Mr. E. P. Ramsay, C.M.Z.S., containing the description of a supposed new species of Flycatcher from New Guinea, proposed to be called *Rhipidura fallax*.—Mr. F. Day read the third of his papers on races and hybrids among the Salmonidæ. The author gave an account of how the salmon, which had been raised in fresh water at Howietown, had been artificially spawned; and pointed out that all the hybrids between the salmon and the trouts had proved sterile, while the hybrids between the trouts and the chars had proved fertile.

Geological Society, November 19.—Prof. T. G. Bonney, F.R.S., President, in the chair.—Nicol Brown, James Charles Chaplin, Herbert W. Hughes, and Rev. Samuel Pilling were elected Fellows; Prof. A. L. O. Descloizeaux, of Paris, a Foreign Member, and Prof. Hermann Credner, of Leipzig, a Foreign Correspondent of the Society.—The following communications were read:—Note on the resemblance of the upper molar teeth of an Eocene mammal (*Neoplagiaulax*, Lemoine) to those of *Tritylodon*, by Sir Richard Owen, K.C.B., F.R.S. In this paper the author referred to the genus *Neoplagiaulax*, described by M. Lemoine from the Eocene of Rheims, as presenting premolars so like those of the Mesozoic genus *Plagiaulax* as to have suggested the above name, while the true molars in the upper jaw resembled those of South African genus *Tritylodon* even more nearly than those of *Microlestes* and *Stereognathus*, with which the latter were compared. The lower molars of *Neoplagiaulax* have only two, instead of three, longitudinal series of tubercles; and the author suggested that this may have been the case also in *Tritylodon*; and that the detached molars, on which the genus *Microlestes* is founded, may also belong to the lower jaw.—On the discovery in one of the bone-caves of Creswell Crags of a portion of the upper jaw of *Elephas primigenius*, containing, *in situ*, the first and second milk-molars (right side), by A. T. Metcalfe, F.G.S. The specimen exhibited to the Society and now described was obtained from one of the Creswell bone-caves, before the commencement of their systematic exploration by a Committee of the British Association. The bone-caves are in the Lower Magnesian Limestone of the Permian, not far from the southern limit of that deposit near Nottingham. The locality was described, and it was shown that the ravine in which the caves occur has been cut in the limestone by the little river Wollen, which probably began by excavating a cavern the whole length of the ravine. The roof of this cavern must have fallen in, and the minor lateral caverns, in which bone-deposits are found, are now similarly being converted into side ravines. The fossil was found in "Pin-Hole Cave," the most westerly on the north or Derbyshire side of the ravine, about six inches below the base of the surface-soil, here four inches deep. The cave has been described in the Society's *Journal* (vol. xxxi. p. 679), by Rev. J. M. Mello, who in 1875 obtained from this spot bones of the Arctic fox (*Canis lagopus*). As the particular mammoth teeth (first and second milk-molars of the upper jaw) occurring in the fossil were wanting in the National Collection, the author has undertaken to present the specimen to the British (Natural History) Museum.—Notes on the remains of *Elephas primigenius*, from the Creswell bone-cave, by Sir R. Owen, K.C.B., F.R.S. The author noticed the various descriptions by Cuvier and himself of milk-molars of *Elephas primigenius*, and pointed out that all hitherto known were found detached. The present is the first known occurrence of the two earliest milk-molars *in situ*. The specimen discovered by Mr. Metcalfe is a portion of the fore part of the maxilla of a very young elephant with the teeth of the right side preserved, the corresponding teeth of the left side and their sockets having been broken away. Of the two teeth thus obtained descriptions and measurements were given. The first tooth is much worn, but only the anterior portion of the second has undergone wear, the two hindmost divisions of this tooth not having risen into use. It is shown that these first teeth of *E. primigenius* differ much less from the corresponding milk-molars of the Indian elephant than the later teeth do, the thickness of the constituent enamel-plates being but little less in proportion, and the principal distinction being the greater relative breadth of the second molar, especially towards the base of the crown.—On the stratigraphical position of the Lower and Middle Jurassic *Trigoniæ* of North Oxfordshire and adjacent districts, by Edwin A. Walford, F.G.S. The author spoke of the value of the *Trigoniæ* as stratigraphical guides, and of the wealth of the Oolitic deposits of North Oxfordshire in number of species as well as of individual forms. He alluded to the recent discovery by Northampton geologists of *Trigonia literata* and *T. pulchella* in the centre of their county. By the presence of certain *Trigoniæ* as well as of corals and bored stones he endeavoured to prove the extension of a stratum at the base of the *Clypeus*-grit at Fawler, as far as Hook Norton, also in North Oxfordshire, where the bulk of the Inferior Oolite was of an altogether different type. In Mr. Walford's list were nearly thirty species and varieties from the Bajocian beds. To the lower horizons there belonged but one local form, and no species of special stratigraphical value. The presence of a few other fossils supposed to be characteristic was the only evidence of beds below the zone of *Ammonites murchisoniæ*. Series C, which appeared to be of the age of the lower *Trigonia*-grit, had yielded the greater part of the *Trigoniæ* mentioned, several of them being peculiar to the horizon, whilst others were local species. The higher beds had yielded some apparently undescribed forms, whilst hitherto unrecorded species were quoted from the Great Oolite and Forest Marble. One species (*T. lycettii*) was described as new.

Chemical Society, December 4.—Dr. Perkin, F.R.S., President, in the chair.—The following papers were read:—

On calorimetric determinations of magnesium sulphate, by S. U. Pickering. The author finds that, when the ordinary heptahydrated salt is heated to 100°-130°, it retains about $1\frac{1}{9}$ molecule of water. This excess of one-ninth may be expelled by heating to 150°-160°, but, if this temperature be exceeded, some anhydrous salt is formed. The numbers obtained with the monohydrated salt were 12,131 cal.; with the anhydrous salt, 20,765 cal.—On condensation compounds of benzil with ethyl alcohol, by Miss M. E. Owens and Dr. F. R. Japp. By the protracted action of very dilute alcoholic potash upon benzil in the cold, the authors have prepared in large quantity a body, $C_{30}H_{24}O_4$, fusing at 200°-201°, and crystallising from alcohol with a molecule of alcohol of crystallisation. No acetyl derivative could be prepared. A second condensation-product, $C_{46}H_{34}O_4$, fusing at 232°, was also obtained.—Note on the solubility of certain salts in fused nitrate of soda, by F. B. Guthrie. The author has experimented with the sulphates, chromates, and carbonates of barium, strontium, calcium, and lead.—On certain derivatives of isodinaphthyl, by A. Staub and Watson Smith. The authors have endeavoured, by gentle oxidation of this body, to form the corresponding naphthoic acid. Cold strong nitric acid, however, produces a tetranitro body; dilute nitric acid in sealed tubes formed phthalic acid, and permanganate gave a similar result. Chromic acid in glacial acetic acid produced isodinaphthylquinone, a yellow amorphous powder melting at 250°-260°.

Edinburgh

Mathematical Society, December 12.—Mr. A. J. G. Barclay, President, in the chair.—Mr. P. Alexander, Lady Margaret's College, Glasgow, contributed a paper on failing cases of Fourier's theorem, remarks on which were made both by Dr. Muir, who read the paper, and by Prof. Chrystal.—Dr. Muir gave a note on a function of two integral arguments; and Mr. A. Y. Fraser discussed the number of conditions determining geometrical figures.

Dublin

Experimental Science Association, November 19.—On Boakes's siphons of sulphur dioxide, by Prof. E. Reynolds, F.R.S.—Photometric measurement of lighthouse illumination, by T. Syle, University student.—On photometers made of paraffin, by J. Joly, B.E. This was an arrangement based on the remarkable difference of appearance presented by a piece of cracked paraffin about the plane of the crack, if placed in an unequally illuminated field. Two similar slabs of paraffin laid together on smooth faces show this effect very well. If the illumination about the plane of contact be brought to equality, the appearance of discontinuity vanishes. The close proximity of the fields to be compared confers great sensibility on the arrangement. The effect is due to the complete dispersion of the light in the translucent paraffin, thereby causing a large amount of it to be totally reflected at the plane of contact, across which, therefore, but little of the light received on either side passes.

Paris

Academy of Sciences, December 8.—M. Rolland, President, in the chair.—Note on the photograph of a tornado taken by J. N. Robinson Howard last August in Dakota, United States, by M. Faye.—Final researches on antiseptic intravascular coagulation, by M. L. Gosselin.—Observations of Wolf's Comet made with the 8-inch equatorial at the Observatory of Bordeaux, by M. G. Rayet.—Observations of the same comet made with the meridian circle at the same observatory, by M. G. Rayet.—On the inversion of the abelian integrals, by M. Appell.—On a trigonometric formula of interpolation deduced from two formulas already established applicable to even and odd functions respectively, by M. G. Fouret.—On a generalisation of continuous fractions, by M. H. Poincaré.—On the integrals of certain functional equations, by M. G. Kœnigs.—Note on the numerical results required for the calculations of compressed gas manometers, by M. E. H. Amagat.—On the application of Ingenhouz and de Senarmont's processes to the measurement of the relative thermic conductibilities of different substances considered as isotropic, by M. Ed. Jannettaz.—On some practical processes for examining the luminous spectra of bodies to which the method of Lecoq de Boisbaudran is inapplicable, by M. Eug. Demarçay.—On ferrocyanhydric acid and the nitroprussiates, by MM. A. Étard and G. Bémont.—On the optic inactivity of the cellulose of cotton, and on the rotatory power of the gun-cotton of photography, by M. A. Béchamp.—Chemical analysis of the so-called "*porte-graine*" beetroot in the second year of its growth, by M. H. Leplay.—On the inertia of the retinal apparatus and its variations according to the exciting colours, by M. Aug. Charpentier. From experiments made during the last few years, the author concludes that the inertia increases with the refrangibility of the stimulating rays. Hence more light is absorbed or used up in producing the luminous sensation for the blue than for the green rays, for the green than for the yellow, and so on to the red. He further shows that any increase of intensity for any given colour requires all the more light in proportion to its greater refrangibility.—On the disease of the vine known by the name of *pourridié*, by MM. G. Foex and P. Viala. This disease, which is common in the South of France, and especially in Provence and Roussillon, is attributed to a species of fungus first observed by R. Hartig, and by him named *Dematophora necatrix*.—On the presence of the middle carboniferous measures in Anjou, by M. Ed. Bureau.—The results are given of a geological survey of this district undertaken during the present year by the author and his brother, the Director of the Natural History Museum of Nantes.—Tables of atmospheric movements between the parallels of latitude 30° S. and 80° N. for November 20, 1879, and January 1, 1880, based on the barometric charts prepared by M. Léon Tisserenc de Bort, by M. Poincaré.

Vienna

Imperial Academy of Sciences, November 13.—Researches into the intimate structure of striated muscle-fibre, by A. Rollett.—Determination of the orbit of the planet *Adria*, by E. von Hœrdtl.—Remarks on the physical constitution of the atmosphere, by N. Herz.—The botanical results of Polack's expeditions to Persia in the year 1882, by O. Stapf.—Report on the plants collected by F. Luschan in Lycia and on the Nimroud Dagh, by the same.

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